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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,938	09/09/2003	James Robert Champion	FOM-139.01	1614

25181 7590 03/27/2007  
FOLEY HOAG, LLP  
PATENT GROUP, WORLD TRADE CENTER WEST  
155 SEAPORT BLVD  
BOSTON, MA 02110

EXAMINER
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BENSON, WALTER

ART UNIT	PAPER NUMBER
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2858

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/27/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/657,938	CHAMPION ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Walter Benson	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-7, 13, 15-17, 19, 21-23, 27, 29-31, 33, 37-43 and 45-63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3, 5, 15-17, 19, 21, 22, 29, 30, 45, 47-54 and 59-63 is/are allowed.
- 6) ☒ Claim(s) 4, 6, 7, 13, 23, 27, 31, 33, 37-43, 46 and 55-58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**FINAL ACTION**

1. Amendment A, received on 1/16/2007, has been entered into record. In the amendment claims 8-12, 14, 18, 20, 24-26, 28, 32, 34-36 and 44 have been canceled, and 54-63 have been added.
2. Claims 1-7, 13, 15-17, 19, 21-23, 27, 29-31, 33, 37-43, and 45-63 are pending.

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 4, 6, 7, 13, 23, 27, 55 and 56 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant claims a first conductive element and a second conductive element, which will reflect a mismatch at the dielectric, mismatch boundary, as depicted in figure 2 and further described as “a parallel conductor transmission line structure “in claim 55. Claim 23 further recite, “driving a first electromagnetic signal along the first conductive element without also driving the second

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conductive element". Hence, the first and second conductor, being in physical proximity to each other, without further shielding element disclosed (figure 3) form an approximation to a transmission line with respect to each other. Because of this, a signal applied to one of the conductors will also drive the second conductor. Evidence of this assertion is presented in "the ARRL Handbook for Radio Amateurs", PTO 1449, filed 8/12/05, which presents a model a two conductor transmission line at page 16-1, figure 2. From this figure, it is evident that through capacitive and inductive coupling, each of the two conductors are inextricably linked. Thus, without some undisclosed measures, it is not possible to drive one of the conductors without driving the other.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 31, 33, 37-43, 46, 57, and 58 rejected under 35 U.S.C. 103(a) as being unpatentable over Macke, Sr. et al. (US 6,137, 282 and Macke hereinafter) in view of Blaine (US Patent No. 6,023,970 and Blaine hereinafter).

5. As to claim 31, Macke discloses a system substantially as claimed, comprising:

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a first conductive element [Fig. 4; 304] and a second conductive element [Fig. 4; 306] so disposed with respect to each other that, when a first electromagnetic signal is propagating along the first conductive element and the first and second conductive elements extend through a dielectric mismatch boundary [col. 1, lines 5-10], the first electromagnetic signal will induce a second electromagnetic signal to propagate along the second conductive element (Fig. 4; col. 4, lines 66-67 and col. 5, line 16);

a processor for evaluating a time delay of the second electromagnetic signal relative to the first electromagnetic signal to determine the value of a quantity on which the mismatch boundary's location depends and generating an output representative of that quantity's value (col. 1, lines 36-44)

Macke did not expressly disclose:

a transmitter operable to drive by conductive coupling the first electromagnetic signal along the at least one first conductive element without also being conductively coupled to the second conductive element [claim 31];

a receiver for receiving the second electromagnetic signal from the at least one second conductive element [claim 31];

where the quantity whose value the output represents is the level of a fluid [claim 58].

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Macke, as evidenced by Blaine.

Blaine discloses a fluid level sensor having:

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a transmitter operable to drive by conductive coupling the first electromagnetic signal along the at least one first conductive element without also being conductively coupled to the second conductive element [claim 31] (col. 9, lines 58-60 and col. 11, lines 32-35);

a receiver for receiving the second electromagnetic signal from the at least one second conductive element [claim 31] (col. 11, lines 39-43);

where the quantity whose value the output represents is the level of a fluid [claim 58] (col. 8, lines 36-38).

Given the teaching of Blaine, a person having ordinary skill in the art at the time of the invention would have readily recognized the desirability and advantages of modifying Macke by employing the well known or conventional features of a sensor technology, such as disclosed by Blaine, in order to efficiently eliminate the influence of noise on the and chance the reflected signals in the Macke system.

6. As to claim 33, Macke discloses where the first electromagnetic signal exhibits an ultra-wideband frequency (col. 3, lines 7-17).

7. As to claim 37, Macke discloses where the first and second conductive elements are flexible (col. 3, line 54).

8. As to claim 38. Macke discloses where the first and second conductive elements exhibit quadrilateral cross-sections (306, 304, Fig. 4; cross section taken lengthwise).

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9. As to claim 39, Macke discloses where the first and second conductive elements exhibit substantially identical cross-sections (Figs. 4 and 5).

10. As to claim 40, Macke discloses where the quantity whose output value the output represents corresponds to a dimension associated with an object (Fig. 5; distance corresponds to width of portion 404)

11. As to claim 41, Macke discloses where the quantity whose value the output corresponds to a displacement between a plurality of objects (distance corresponds to the displacement between buttons 310a-310f).

12. As to claim 42, Macke discloses where the quantity whose value the output represents corresponds to an angular orientation (col. 3, line 54, buttons in curved path would have an angular relationship to another rather than linear).

13. As to claim 43, Macke discloses where the quantity whose value the output represents corresponds to a degree of pressure (Fig. 4; corresponds to pressure on the buttons).

14. As to claim 46, Macke discloses where the first electromagnetic signal propagates from a first end of the first conductive element toward a second end of the first conductive element, and the propagation of the first electromagnetic signal through the boundary will induce the second

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electromagnetic signal to propagate along the second conductive element toward a first end of the second conductive element (figs 4-5; 304, 306 and 408-410).

15. As to claim 57, Macke discloses where least one said first conductive element is positioned substantially parallel to at least one said second conductive element (304, 306, Fig 4; col. 4, lines 56-57).

#### ***Allowable Subject Matter***

16. Claims 1-3, 5, 15-17, 19, 21, 22, 29, 30, 45, 47-54, and 59-63 are allowable over the prior art of record.

The prior art of record fails to teach in combination as claimed a system having a coupler, mounted for so sliding through a range of positions with respect to the first and second conductive elements as to respond to the first electromagnetic signal by launching on the second conductive element a second electromagnetic signal received by the receiver with a timing with respect to the first electromagnetic signal that depends on the coupler's position.

#### ***Response to Arguments***

17. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.



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18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


#### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter Benson whose telephone number is (571) 272-2227. The examiner can normally be reached on Mon to Fri 6:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on (571) 272-2168. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Walter Benson  
Primary Examiner



Replacement Sheet

1/7

Approved  
for  
entry  
W3enson  
1/30/2007

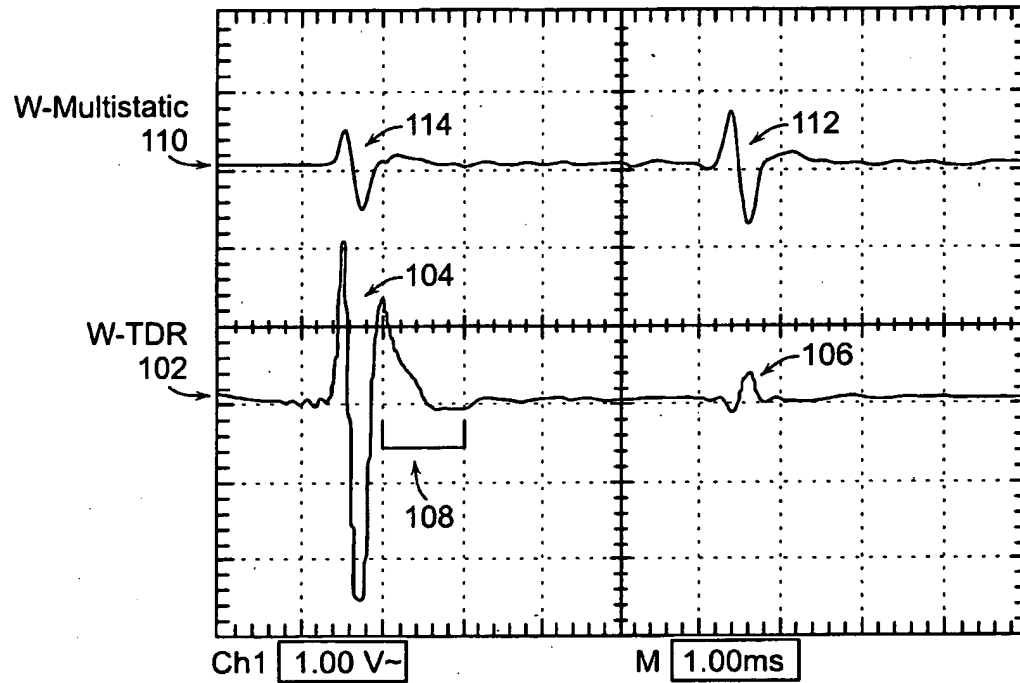


FIG. 1

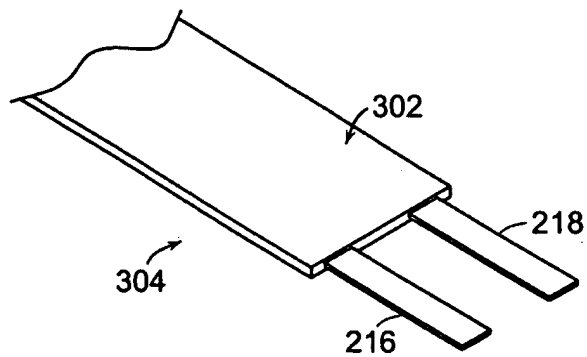


FIG. 3